

CUSTOMER SERVICE SYSTEM FOR USE IN IC CARD SYSTEM

BACKGROUND OF THE INVENTION

This invention relates to a customer service system for use in an IC card system, which can provide IC card users (card holders) with services other than ordinary transactions at shops or the like. The invention also relates to an IC card system, which allows a card holder to register a personal identification number (PIN) in his or her IC card and to re-register this number, reliably and accurately.

The present time has been called a "cashless era." A variety of cards have been issued by credit companies or the like. Using these cards, customers can purchase commercial commodities.

Among these cards are plastic cards, embossed cards and cards having magnetic stripes. Such cards, however, can be easily forged.

It is therefore desirable to increase the security of these cards to prevent forging and deter illegal use thereof. To meet this demand, there has been developed a so-called IC card containing an IC circuit. The PIN is stored in the IC card in such a way that it can not be readily read from the card. Such an IC card is combined with an IC card terminal, providing an IC card system.

The IC card gives and receives data to and from an IC card terminal which is installed in a bank, shop, etc. for (1) identifying the card holder from the PIN, (2) verifying the IC card, (3) verifying the IC card terminal and (4) performing a transaction.

Such an IC card system is disclosed in detail in U.S. patent application Ser. No. 645,925 entitled "IC Card and An Identification Thereof" filed on Aug. 30, 1984 by the assignee of the invention.

The IC card system, however, has a drawback. If the IC card holder has forgotten his or her personal identification number, he or she can no longer be identified by using the IC card. Therefore, the IC card becomes virtuously useless. Further, should the PIN become known to any other person, it should be changed to prevent its illegal use, but in the invention described above, it cannot be altered. Further, the transaction history stored in the IC card cannot be readily confirmed.

The IC cards used in U.S. patent application Ser. No. 645,925 described above, are manufactured by a manufacturer, an issuer, and finally used by card holders. After manufacturing an IC card, the manufacturer writes predetermined codes in the IC card by using an IC card terminal. Among the written codes are CA (Card Authenticator), IPIN (Initialization Personal Identification Number), PMK (Production Master Key) and PRK (Private Key code). The CA code is used for encryption and decryption of messages. The IPIN code consists of a random 6 bits, for instance, and is used until the PIN has been established. The PMK code is a manufacturer's number, used commonly for IC cards of the same lot. The PRK code is used for decryption of messages. After these codes have been written in the IC card, the PMK code is printed on a sheet of paper. The manufacturer sends the IC card and the sheet by separate mail to the issuer. The issuer writes a PAN (Primary Account Number) code in the IC card by using an IC card issuance terminal. More precisely, the issuer inputs the PMK code printed on the sheet into the terminal, and then inputs the PAN code into the terminal. The PAN

code is stored in the card when the PMK code already written in the IC card is identical with PMK code input from the terminal. At the same time, the IPIN is read from the IC card and is printed on a sheet of paper. The issuer sends the IC card and the sheet by separate mail to the IC card holder. The IC card holder takes the IC card and the sheet to the issuer, and inputs his or her PIN code, using the IC card holder terminal installed in the card issuer's location. More precisely, the card holder inputs the IPIN code printed on the sheet into the terminal, and then inputs his or her PIN code into the terminal. The PIN code is written into the IC card when the IPIN code input to the terminal is identical with the IPIN code already written into the IC card. After the above processes have been effected, the IC card can be used.

If the IC card holder mistakenly writes a wrong PIN code into the IC card, the IC card will later be rejected when the card is inserted in the terminal and the card holder inputs the correct PIN to the terminal. There is another problem. When the card holder inputs the PIN code to the terminal in a bank or the like, there may be other persons near the terminal. These persons may see the PIN. This can spoil security of the IC card. To preserve the security of the IC card, the PIN can be re-entered. However, it is possible that the card holder is again liable to mistakenly enter a wrong number as the new PIN code, thus disabling the subsequent use of the IC card.

SUMMARY OF THE INVENTION

It is, therefore, an object of the invention to provide a new and improved customer service system for use in an IC card system, which can improve the functions of the IC card system and promote the convenience for the IC card users by providing the customers with special services, in addition to the ordinary transaction services, such as alteration of the PIN, and access to transaction data, in co-operation with the IC card issuer (e.g., bank) in case of necessity.

Another object of the invention is to provide an IC card system, which permits the registration or alteration of the PIN data in the IC card by the IC card holder reliably and accurately.

According to the invention, there is provided a customer service system for use in an IC card system comprising:

a customer's IC card including at least an IC circuit having first memory means for storing the personal identification number of a customer, second memory means for storing secret data, interface means for controlling the output of data from said IC card and input of data to said IC card, comparator means for comparing data input through said interface means with data stored in first memory means, and control means for controlling said first and second memory means, said interface means and comparator means in accordance with selective execution of a plurality of predetermined items of a customer service menu;

display means;

display control means for causing said display means to display the items of the customer service menu and to display necessary data including messages, once or repeatedly, in accordance with selective execution of said items of the menu; and

customer's IC card read-write means including a loading section for loading said customer's IC card, a